

Mohamed Sharawy



Lecturer

Electrical Engineering Department

Electrical Power and Machines Engineering Specialization

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Personal Details

Full Name	Mohamed Mahmoud Anwar Mohamed Sharawy
Date of Birth	28 December 1987
Place of Birth	Giza, Egypt
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Research Interests

- Electrical Machines and Drives.
- Special Machines and Their Drive Systems.
- Control and Dynamic Simulation of Electrical Machines.
- Electrical Machines Modeling and Operation.
- Renewable Energy (Wind Energy).

Education

Feb. 2017– Dec. 2021	Ph.D., Electrical Power and Machines Engineering Department, Faculty of Engineering at Shoubra, Benha University.
Sep. 2011– Jul. 2016	M.Sc., Electrical Power and Machines Engineering Department, Faculty of Engineering, Cairo University.
Sep. 2005–May. 2010	BSc, Electrical Engineering Department, Shoubra Faculty of Engineering, Benha University, Cairo, Egypt. Grade: Excellent with honors degree (85%) (3rd on my colleagues).

Ph.D. Thesis

Title	Control of Wind Driven Stand-Alone Doubly-Fed Induction Generators.
Supervisors	- Prof. Dr. Adel Shaltout (Professor Electrical Power and Machines Engineering Department - Faculty of Engineering Cairo University) - Prof. Dr. Naser M. B. Abdel-Rahim (Professor of Power Electronics –Electrical Engineering Department – Faculty of Engineering at Shoubra – Benha University)

	<p>- Prof. Dr. Mahmoud A. AL-Ahmar (Professor of Electrical Machines –Electrical Engineering Department – Faculty of Engineering at Shoubra – Benha University)</p> <p>- Dr. Omar Elsayed Youssef (Lecturer –Electrical Engineering Department – Faculty of Engineering at Shoubra – Benha University)</p>
Description	<p>The DFIG is controlled to maintain the stator output voltage and frequency at rated value when supplying an IM irrespective of generator speed. The MPPT control is applied to improve the performance of the system. The capability limits of the DFIG and RSC is obtained at the rated stator output voltage and frequency. The DFIG rating according to the requirements of the directly connected IM is scaled. It is found that to start-up an IM directly by using DFIG at rated stator output voltage and frequency, the generator rating must be sized up to 8-9 times the capacity of the motor power rating with system efficiency equal to 16 %. The RSC connected to the DFIG is controlled to produce variable stator output voltage and frequency keeping V/f constant in order to solve the problems associated with the start-up period of directly connected IM without using any additional starting method. As the operating voltage and frequency is decreased the starting current of IM is decreased and the possibility to start larger hp rating of IM is increased. The capability limits of the DFIG and RSC are calculated at variable stator output voltage and frequency which mainly depends on the rotor voltage and operating slip. The DFIG capability is increased in order to supply larger IM rating by decreasing the WT speed to minimum operating value and the stator output voltage and frequency to the lowest possible value. The DFIG is succeeded to operate at stator output voltage and frequency of 37 % of the rated values without exceeding the system capability limits. The DFIG rating according to the requirements of connected IM when using constant V/f control method and WT speed control is re-scaled. It has been found that to start-up an IM directly by using DFIG at stator output V and F of 37 % of the rated values, the generator rating must be sized up to 3-4 times the capacity of the motor power rating with system efficiency equal to 40 %. The DFIG capability and efficiency is increased by 250% and the generator rating requirement is reduced by 45 % by using the proposed control method.</p>
Publications	<p>[1] M. Sharawy, A. A. Shaltout, N. Abdel-Rahim, M. A. Al-Ahmar, O. E. M. Youssef, “Starting of Induction Motor Fed with Stand-Alone</p>

	<p>DFIG,” <i>Bulletin of Electrical Engineering and Informatics</i>, Vol.10, No.5, pp. 2414 -2423, October 2021.</p> <p>[2] M. Sharawy, A. A. Shaltout, N. Abdel-Rahim, O. E. M. Yossef, M. A. Al-Ahmar, “Simplified Steady State Analysis of Stand-Alone Doubly Fed Induction Generator,” <i>22nd International Middle East Power Systems Conference</i>, Assiut University, Egypt, 14-16 December 2021.</p>
M.Sc. Thesis	
Title	Voltage and Frequency Control of Stand-Alone Doubly-Fed Induction Generators for Variable Speed Wind Energy Conversion Systems.
Supervisors	<p>Prof. Adel Shaltout (Professor Electrical Power and Machines Engineering Department - Faculty of Engineering Cairo University)</p> <p>Prof. Naser M. B. Abdel-Rahim (Professor of Power Electronics – Electrical Engineering Department – Faculty of Engineering at Shoubra – Benha University)</p>
Description	Self-excited induction generators usually suffer from variable output voltage frequency and magnitude with variation of wind speed when they are used in stand-alone variable speed Wind Energy Conversion Systems (VSWECS). The doubly fed induction generators (DFIGs) have been used in stand-alone VSWECS applications. Controlling the magnitude and frequency of the stator output voltage for DFIG achieved by controlling the rotor input voltage, magnitude and frequency. The maximum power point tracking control technique is applied to DFIG for optimum operating point.
Publications	<p>[1] M. Sharawy, N. Abdel-Rahim, Adel A. Shaltout, “Modeling and Control of Stand-Alone Doubly-Fed Induction Generator Used in Wind Energy Conversion Systems”, <i>Recent Trends in Energy Systems Conference (RTES)</i>, Cairo, Egypt, 3 October 2015, pp 181-199</p> <p>[2] M. Sharawy, N. Abdel-Rahim, Adel A. Shaltout, “Voltage and Frequency Control of Stand-Alone Doubly-Fed Induction Generator used in WECS”, <i>17th International Middle East Power Systems Conference</i>, Mansoura University, Egypt, December 15-17, 2015</p>
Work Experience	
Jun. 2022 – Till Now	<p>Lecturer at The Department of Electrical Power Engineering, Shoubra Faculty of Engineering, Benha University, Cairo, Egypt.</p> <p>Courses Taught:</p> <p>A- Under Graduated Courses:</p>

	<p>1) - Electrical Machines (1) (DC Motors, DC Generators and Transformers)</p> <p>2) - Electrical Machines (2) (Induction Motors, Induction Generators, Synchronous Generators and Synchronous Motors)</p> <p>3) - Electrical Machines (3) (Special Machines, Analysis and Design of Electrical Machines)</p> <p>4) – Electrical Drives Systems (Mechanics, Electrical Machines and Power Electronics used in Drive Systems)</p> <p>5) - Power Electronics (Power Electronics Devices, Power Converters and Power Inverters)</p> <p>6) – Basics of DC and AC Circuits.</p> <p>7) - Electrical Machines Tests Laboratory</p> <p>8) - Power Electronics Tests Laboratory</p> <p>9) – Industrial Control, HMI, PLC (SEMEINS S7-300), Classic Control, MATLAB and Proteus Trainer.</p> <p>B- Post Graduated Courses:</p> <p>1) - Advanced Study of Electrical Machines.</p> <p>2) – Advanced Study in Electrical Drive Systems</p> <p>3) – Selected Topics of Electrical Machines</p> <p>Co-Supervision of Graduation Projects:</p> <p>1) – Design, Simulation and Implementation of Water Filling and Production Line using PLC.</p> <p>2) – Design, Simulation, and Implementation of Photovoltaic Energy System Feeding Water Desalination</p> <p>3) – Design, Simulation, and Implementation of Photovoltaic Energy System Feeding Water Pumping System</p>
Jul. 2012 – Dec. 2021	<p>Demonstrator at The Department of Electrical Power Engineering, Shoubra Faculty of Engineering, Benha University, Cairo, Egypt.</p> <p>Courses Taught:</p> <p>1) - Electrical Machines (1) (DC Motors, DC Generators and Transformers)</p> <p>2) - Electrical Machines (2) (Induction Motors, Induction Generators, Synchronous Generators and Synchronous Motors)</p> <p>3) - Electrical Machines (3) (Special Machines, Analysis and Design of Electrical Machines)</p> <p>4) - Electrical Machines Tests Laboratory</p> <p>5) - Power Electronics (Power Electronics Devices, Power Converters and Power Inverters)</p> <p>6) - Power Electronics Tests Laboratory</p>

	7) - PLC (SEMEINS S7-300), Classic Control and Proteus Trainer.
Feb. 2012 – Jul. 2012	Electricity Office Engineer at IDA (Industrial Development Authority), Ministry of Trade and Industry, Cairo, Egypt
Feb. 2011 – Feb. 2012	Demonstrator at Misr University For Science & Technology, Cairo, Egypt. <u>Courses Taught:</u> 1) - DC Circuits 2) - AC Circuits
Languages	
Arabic	Mother Language
English	Very Good
Computer Skills	
Operating Systems	Windows
Microsoft Office	Word, Excel, Power Point
Programming	MATLAB, PLC, HMI, Proteus